

Claims

- [c1] 1.A method of forming a liquid surfactant comprising the steps of mixing aqueous hydrogen peroxide with coal, allowing the mixture to stand and separating the liquid fraction from the solid fraction.
- [c2] 2.The method of claim 1 wherein the coal comprises low-rank coal.
- [c3] 3.The method of claim 2 wherein the mixture is allowed to stand for at least about 12 hours.
- [c4] 4.The method of claim 2 wherein the hydrogen peroxide has a concentration of about 3% to about 6%.
- [c5] 5.The method of claim 2 wherein the low-rank coal comprises lignite.
- [c6] 6.The method of claim 2 wherein the mixture comprises 1 part lignite to about 3 parts hydrogen peroxide by volume.
- [c7] 7.A surfactant for use in separating solids from hydrocarbons comprising aqueous hydrogen peroxide which has been contacted with coal.
- [c8] 8.The surfactant of claim 7 wherein the coal comprises low-rank coal.
- [c9] 9.The surfactant of claim 8 wherein the low-rank coal is lignite.

- [c10] 10.The surfactant of claim 9 comprising between about 3% to about 6% hydrogen peroxide.
- [c11] 11.A method of separating hydrocarbons from solids comprising the step of contacting the solids/hydrocarbon with a surfactant of one of claims 7 to 10, or produced by the method of one of claims 1 to 6.
- [c12] 12.The method of claim 11 wherein the solids/hydrocarbon is contacted with the surfactant with no or mild agitation.
- [c13] 13.The method of claim 11 wherein the contacting step is performed at between about 40Â°C and 80Â°C.